Claims

1. Polypeptide comprising at least three components A and at least two components B, wherein each component A is a monomer of a member of the TNF ligand family or a functional fragment, and/or a functional variant thereof, and each component B is a peptide linker.

2. Polypeptide according to claim 1, wherein components A are identical or different.

3. Polypeptide according to any one of the preceding claims, wherein components A stem from the same organism or different organisms.

4. Polypeptide according to any one of the preceding claims, wherein components A are selected from the group, consisting of FasL, TRAIL, TNF, CD30L, CD40L, OX40L, RANKL, TWEAKL, LTalpha, LTbeta, LIGHT, CD27L, 41-BB, 41BBL, GITRL, APRIL, EDA, VEGI, and BAFF.

5. Polypeptide according to any one of the preceding claims, wherein components B each link together two of the at least three components A.

6. Polypeptide according to any one of the preceding claims, wherein at least one of components B has the amino acid sequence $(GGGS)_3$ or $(GGGS)_4$.

7. Polypeptide according to any one of the preceding claims, wherein components A and components B form a trimeric protein structure.

8. Polypeptide according to claim 7, wherein components A and components B form a homotrimeric protein structure.

9. Polypeptide according to claim 7, wherein components A and components B form a heterotrimeric protein structure.

10. Polypeptide according to any one of the preceding claims, wherein components B are identical or different.

11. Polypeptide according to any one of the preceding claims, wherein components B stem from the same organism or different organisms.

12. Polypeptide according to any one of the preceding claims, wherein the polypeptide has a preferably N-terminal tag sequence, particularly a His tag sequence or a Flag tag sequence.

13. Polypeptide according to any one of the preceding claims, wherein the polypeptide has a preferably N-terminal leader peptide sequence.

14. Polypeptide according to any one of the preceding claims, wherein the polypeptide has at least one other component C, which is an antibody fragment or a different protein or peptide, which selectively recognizes a specific target molecule on the cell surface.

15. Polypeptide according to claim 14, wherein component C is an antibody fragment from a mammal, particularly of murine or human origin, or a humanized antibody fragment.

16. Polypeptide according to claim 14 or 15, wherein the antibody fragment can be present in different antibody formats, e.g., as scFv, particularly scFv40.

17. Polypeptide according to claim 14, wherein component C is a protein or peptide with specificity for a cell surface molecule, particularly a cytokine receptor, a growth factor receptor, an integrin, or cell adhesion molecule.

18. Polypeptide according to claim 17, wherein the cytokine receptor is selected from the group of the TNFR gene family.

19. Nucleic acid coding for a polypeptide according to any one of the preceding claims 1 through 18.

20. Vector containing the nucleic acid according to claim 19.

21. Host cell containing the nucleic acid according to claim 19 and/or the vector according to claim 20.

22. Method for preparing a host cell according to claim 21, comprising the following steps:
    a. Preparation of a nucleic acid according to claim 19 or a vector according to claim 20, and
    b. Introduction of the nucleic acid and/or vector according to step (a) into a cell.

23. Method for preparing a polypeptide according to any one of claims 1 through 18, comprising the following steps:
    a. Culturing of a host cell according to claim 21 under suitable conditions,
    b. Expression of the nucleic acid according to claim 19 under suitable conditions, and
    c. Isolation of the polypeptide from the host cell and/or the culture supernatant.

24. Use of a polypeptide according to any one of claims 1 through 18, a nucleic acid according to claim 20 [sic], a vector according to claim 20, or a host cell according to claim 21 for the preparation of a medication for the treatment of cancer diseases, particularly solid or lymphatic tumors, infectious diseases, metabolic diseases, inflammatory conditions, hyperproliferative diseases, autoimmune diseases,

particularly rheumatoid/arthritic diseases, toxic epidermal necrolysis (TEN), multiple sclerosis, Hashimoto's thyroiditis, GVHD, viral hepatitis (HBV, HCV), alcohol-induced hepatitis, rejection reactions in liver transplantation, diseases based on hyperapoptotic reactions, and degenerative diseases, particularly neurodegenerative diseases.

25. Use of a polypeptide according to any one of claims 1 through 18, a nucleic acid according to claim 19, a vector according to claim 20, or a host cell according to claim 21 for the treatment of cancer diseases, particularly solid or lymphatic tumors, infectious diseases, metabolic diseases, inflammatory conditions, hyperproliferative diseases, autoimmune diseases, particularly rheumatoid/arthritic diseases, toxic epidermal necrolysis (TEN), multiple sclerosis, Hashimoto's thyroiditis, GVHD, viral hepatitis (HBV, HCV), alcohol-induced hepatitis, rejection reactions in liver transplantation, diseases based on hyperapoptotic reactions, and degenerative diseases, particularly neurodegenerative diseases.

26. Pharmaceutical composition, at least containing a polypeptide according to any one of claims 1 through 18 and/or a nucleic acid according to claim 19 and/or a vector according to claim 20 and/or a host cell according to claim 21, as well as pharmaceutically acceptable aids, additives, and/or carrier substances.

27. Pharmaceutical composition according to claim 26 for the treatment of cancer diseases, particularly solid or lymphatic tumors, infectious diseases, metabolic diseases, inflammatory conditions, hyperproliferative diseases, autoimmune diseases, particularly rheumatoid/arthritic diseases, toxic epidermal necrolysis (TEN), multiple sclerosis, Hashimoto's thyroiditis, GVHD, viral hepatitis (HBV, HCV), alcohol-induced hepatitis, rejection reactions in liver transplantation, diseases based on hyperapoptotic reactions, and degenerative diseases, particularly neurodegenerative diseases.

28. Method for extracorporeal manipulation, depletion, and/or removal of soluble, suspended components or cellular blood components comprising the following steps:

a) Optionally separation of the blood into one or more fractions with solid and/or liquid components;

b) Binding of soluble, suspended, or cellular blood components to a surface or particle coupled to a polypeptide according to any one of claims 1 through 18; and

c) Optionally separation of the bound soluble, suspended, or cellular blood components.

29. Method according to claim 28, wherein before step a) or b) blood is taken from a patient.

30. Method according to claim 28, wherein after a step b) or c), the thus treated blood or blood fraction is reinjected into a patient.